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NAMRU-2 Scientists Highlight Ongoing Dengue Research in Cambodia at ASTMH

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LCDR Catherine Berjohn (left), Head of Naval Medical Research Unit 2 (NAMRU-2), Clinical Investigation Department presents findings on Dengue Research in Cambodia during the American Society of Tropical Medicine and Hygiene (ASTMH) annual meeting held in Atlanta, Georgia from Nov. 13-17. (Photo From NMRC Public Affairs)

SILVER SPRING, Md. – During poster sessions at the American Society of Tropical Medicine and Hygiene (ASTMH), in Atlanta, Georgia, Nov. 13-17, researchers from the U.S. Naval Medical Research Unit -2 (NAMRU-2), located in Phnom Penh, Cambodia, showcased results from longstanding research into dengue fever in Cambodia.

Dengue fever is recognized as an infectious disease threat to operational military forces in regions where the disease is endemic. Navy Medicine's research, including the research conducted by NAMRU-2, seeks to identify the risk that dengue fever poses to deployed military forces and aims to develop strategies to mitigate these threats.

Dengue fever, also called breakbone fever, is a mosquito-borne viral infection endemic to tropical regions. According to the World Health Organization (WHO) the global burden of dengue is estimated to nearly 400 million dengue infections per year and approximately 4 billion people in over 120 countries are at risk of infection with dengue viruses. There is no specific treatment for dengue. Symptoms are flu-like and include high fever, rash, and muscle and joint pain. In severe cases there is serious bleeding and shock, which can be life threatening.

Lt. Cmdr. Catherine Berjohn, the Head of NAMRU-2's Clinical Investigation Department, presented on an ongoing cohort study in Cambodia. During a six year period, from January 2010 to February 2016, NAMRU-2 enrolled nearly 20,000 individuals into a cohort study of febrile patients. Within this cohort, investigators were able to assess the sensitivity and specificity of a

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clinical diagnosis of dengue infection compared to confirmational testing for infection using one of several laboratory-based methods.

“The results indicated laboratory-based diagnostic tools such as the widely used rapid test for the NS1 antigen or PCR-based assays offer an improvement over diagnoses based solely on clinical evidence. Serological data gleaned from the study also confirmed the circulation of all four dengue serotypes in Cambodia,” said Berjohn.

There are four distinct, but closely related serotypes of the virus that cause dengue. Recovery from infection by one provides lifelong immunity against that particular serotype. However, cross-immunity to the other serotypes after recovery is only partial and temporary. Subsequent infections by other serotypes increase the risk of development severe disease known as Dengue Hemorrhagic Fever (DHF) or Dengue Shock Syndrome (DSS), both of which can be fatal.

“The take home message is that the study highlights the importance of access to laboratory testing” said Berjohn. “Improved access to advanced diagnostic methodologies may help to improve the quality of care and reduce unnecessary antimicrobial use and resultant antimicrobial resistance.”

Studies into dengue fever in Cambodia also led to the interesting discovery of a case of co-infection, presented at this year’s ASTMH meeting by Lt. Cmdr. Jamal Dejli, the Head of NAMRU-2’s Laboratory Services Department. NAMRU-2 researchers identified a 15 year old male from Stung Treng Province in northern Cambodia who had concomitant infections with the dengue type 1 virus and dengue type 2 virus. The patient presented with a temperature of 38.5°C, complaints of malaise, chills, headache, hematuria, and gingival bleeding. A dengue diagnosis was initially provided by rapid testing and the co-infection was identified by PCR. The clinical course of the infections was uncomplicated and the patient made a full recovery.

“To our knowledge, this is the first documented case of dengue co-infection with type 1 and type 2 in Cambodia,” said Dejli. “This work highlights the importance of dengue surveillance with serotyping. With such a high prevalence of dengue in Cambodia and Southeast Asia in general, the absence of serotype-specific information may impede clinical management not only of the local population but also our deployed troops to the region.”

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